

Abstract Submitted
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Search for $0\nu\beta\beta$ with CUORE: experiment and cryogenic systems overview¹ ALEXEY DROBIZHEV², University of California Berkeley, Lawrence Berkeley National Laboratory, CUORE COLLABORATION — CUORE—the Cryogenic Underground Observatory for Rare Events—is a search for the neutrinoless double beta decay of ^{130}Te based at the Gran Sasso National Laboratories in Italy. The experiment, currently in its final stages of commissioning, is expected to begin data taking in 2016 and eventually be sensitive to a $\sim 10^{26}$ y half life after a 5 y live time. The detector consists of an array of 988 $5\times 5\times 5$ cm³ TeO₂ crystals (204 kg isotope mass) operated as bolometers at ~ 10 mK temperatures with Ge NTD readout. Running a ~ 1 t, ~ 1 m³ detector at such temperatures necessitated the design and construction of the world's largest and most powerful dilution refrigerator, capable of reaching temperatures < 10 mK and producing ~ 2 mW of cooling power at 100 mK. The cryostat is optimized for noise and vibration isolation, as well as radiopurity. We report the expected and observed performance of the CUORE experiment and, in particular, its cryogenic systems.

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